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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,502	06/20/2003	Yury D. Levin	P16504	6745

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EXAMINER	
ZHENG, EVA Y	
ART UNIT	**PAPER NUMBER**
2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/600,502	LEVIN ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,10-16,18-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16,18 and 19* is/are allowed.

6)☒ Claim(s) *1-7,10-15 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Amendment, filed 2/5/07, with respect to the rejection(s) of claim(s) s 1-7, 10-16, 18-23 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Objections

2. Claim 4 and 5 are objected to because of the following informalities: on line 3, please change ":" after "zero" to -- ,--.

3. Claim 6 and 6 are objected to because of the following informalities: on line 3, please change ":" after "one" to -- ,--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-7, 10-15, and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agami et al (US 2002/0159535) in view of Sakagami et al (US 2003/0110444).

a) Regarding to claims 1 and 14, Agami et al disclose a method, comprising:

receiving via a decoder input path a coordinate value associated with a Trellis decoder (204,202,206 in Fig. 2), the received coordinate value including an integer portion and a fractional portion ([0028]);

calculating a difference between the received coordinate value and a pre-determined coordinate value ([0039-0040] and [0044]);

determining a distance value associate with a distance between a received coordinate location and a pre-determined constellation point based at least in part on the difference ([0012] and [0015]; equation 5);

performing a Trellis decoding process based at least in part on the distance value (202 and 206 in Fig. 2); and

outputting via a decoder output path a decoded result of the Trellis decoding process (DATA bits in Fig. 2).

Agami et al disclose that the difference is dependent on whether the integer portion is even or odd, but is silent about evaluating a least significant bit of the integer portion to determine whether the integer portion is even or odd.

However, Sakagami et al disclose that symbol value is either even or odd depending on the LSB of the symbol. The symbol is even if the LSB is "0", and odd if the LSB is "1" ([0092]). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of evaluating of LSB by Sakagami et al with the decoding system by Agami et al. By doing so, provide faster and efficient calculations in decoding algorithm of a communication system.

b) Regarding to claims 2 and 15, Agami et al disclose wherein the received coordinate value comprises one of an X axis value and a Y axis value (Fig. 3).

c) Regarding to claim 3, Sakagami et al disclose wherein said evaluation comprises determining whether the least significant bit of the integer portion is a zero or a one ([0089]).

d) Regarding to claims 4-7, Agami et al disclose that depending on whether the integer portion is even or odd, the difference between the received coordinate value and predetermined value is equal to f or 1-f ([0032]). Agami does not explicitly described the condition when the difference is 1+f and 2-f. However, Agami disclose that the total distance is 2 [0032]. When the integer portion is odd, the difference between the received coordinate value and the closest predetermined value is f, which indicate that the difference to the other predetermined value is 2-f. When the integer portion is even, the difference between the received coordinate value and the closest predetermined value is 1- f, which indicate that the difference to the other predetermined value is 1+f. Therefore, Agami implicitly teaches the condition of difference of 1+f and 2-f.

e) Regarding to claim 10, Agami et al disclose an apparatus, comprising:

an input path to receive an X coordinate value associated with a Trellis decoder, wherein the received X coordinate value comprises an X integer portion and an X-fractional portion (Fig. 2 and 3).

Agami et al disclose that depending on whether the integer portion is even or odd, the difference between the received coordinate value and predetermined coordinate value is equal to f or 1-f ([0032]). Agami does not explicitly described the

condition when the difference is 1+f and 2-f. However, Agami disclose that the total distance between two predetermined coordinate values is 2 [0032]. When the integer portion is odd, the difference between the received coordinate value and the closest predetermined coordinate value is f, which indicate that the difference to the other predetermined coordinate value is 2-f. When the integer portion is even, the difference between the received coordinate value and the closest predetermined coordinate value is 1- f, which indicate that the difference to the other predetermined coordinate value is 1+f. Therefore, Agami implicitly teaches the condition of difference of 1+f and 2-f.

Agami et al disclose that the difference is dependent on whether the integer portion is even or odd, but is silent about evaluating a least significant bit of the integer portion.

However, Sakagami et al disclose that symbol value is either even or odd depending on the LSB of the symbol. The symbol is even if the LSB is "0", and odd if the LSB is "1" ([0089]). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of evaluating of LSB by Sakagami et al with the decoding system by Agami et al. By doing so, provide faster and efficient calculations in decoding algorithm of a communication system.

f) Regarding to claim 11, Agami et al disclose Y coordinate value associated with the Trellis decoder, depending on whether the integer portion is even or odd, the distance is equal to f or 1-f ([0044]). Agami does not explicitly described the condition when the difference is 1+f and 2-f. However, Agami disclose that the total distance between two predetermined coordinate values is 2 [0032]. When the integer portion is

odd, the difference between the received coordinate value and the closest predetermined coordinate value is f, which indicate that the difference to the other predetermined coordinate value is 2-f. When the integer portion is even, the difference between the received coordinate value and the closest predetermined coordinate value is 1- f, which indicate that the difference to the other predetermined coordinate value is 1+f. Therefore, Agami implicitly teaches the condition of difference of 1+f and 2-f.

g) Regarding to claims 12, 20 and 22, Agami et al disclose an apparatus, comprising:

an input to receive a coordinate value associated with a Trellis decoder (Fig. 2), the received coordinate value including an integer portion and a fractional portion ([0028]); and

a multiplexer to receive (i) the fractional portion (f input to mux); and (iii) the least signification bit of the integer portion as a control signal (odd/even as a control signal in Fig. 4).

Agami et al disclose one minus the fractional portion input to the multiplexer, but is silent about the fractional portion plus one ([0032]). Agami disclose that the total distance is 2 between the received coordinate value and the two predetermined coordinate values [0032]. When the integer portion is odd, the difference between the received coordinate value and the closest predetermined coordinate value is f, which indicate that the difference to the other predetermined coordinate value is 2-f. When the integer portion is even, the difference between the received coordinate value and the closest predetermined coordinate value is 1- f, which indicate that the difference to the

other predetermined coordinate value is 1+f. If the difference is known to be 1-f, the other difference is known to be 1+f, or vice versa. 1-f and 1+f provide the same information regarding to the received coordinate value with the two closest predetermined coordinated values. Therefore, it would not make a difference to whether to input 1-f or 1+f to the multiplexer. It would not provide particular advantage to solve a particular problem (i.e, determine the minimum distance and differences between the received coordinate value and the predetermined coordinate value). Therefore, it is obvious to input 1+f instead of 1-f to the multiplexer.

Agami et al disclose odd/even control signal in the multiplexer, but is silent about the least signification bit of the integer portion. However, Sakagami èt al disclose that symbol value is either even or odd depending on the LSB of the symbol. The symbol is even if the LSB is "0", and odd if the LSB is "1" ([0092]). Therefore, it is obvious to one of ordinary skill in art to combine the teaching of evaluating of LSB by Sakagami et al with the decoding system by Agami et al. By doing so, provide faster and efficient calculations in decoding algorithm of a communication system.

h) Regarding to claims 13, 21 and 23, Agami et al disclose all the subject matter above and a multiplexer to receive (i) one minus the fraction portion (Fig. 4). However, Agami is silent about two minus the fractional portion input to the multiplexer. Agami disclose that the total distance is 2 between the received coordinate value and the two predetermined coordinate values [0032]. When the integer portion is odd, the difference between the received coordinate value and the closest predetermined coordinate value is f, which indicate that the difference to the other predetermined coordinate value is 2-f.

When the integer portion is even, the difference between the received coordinate value and the closest predetermined coordinate value is 1- f, which indicate that the difference to the other predetermined coordinate value is 1+f. If the difference is known to be f, the other difference is known to be 2-f, or vice versa. f and 2-f provide the same information regarding to the received coordinate value with the two closest predetermined coordinated values. Therefore, it would not make a difference to whether to input f or 2-f to the multiplexer. It would not provide particular advantage to solve a particular problem (i.e, determine the minimum distance and differences between the received coordinate value and the predetermined coordinate value). Therefore, it is obvious to input 2-f instead of f to the multiplexer.

Allowable Subject Matter

6. Claims 16, and 18-19 are allowed.

7. The following is an examiner's statement of reasons for allowance:

None of the prior art teaches or suggests a decoder comprises estimate a distance between the received location and the pre-determined constellation point based on X and Y values; estimate the distance as the X value multiplied by a pre-determined value when the X value is larger than the Y value, and estimating the distance as the Y value multiplied by the pre-determined value when the Y value is larger than the X value.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2611

April 26, 2007

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER